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Education-learning-development and the research method in the conception of L.V. Zankov[1]

Education-learning-development and the research method in the conception of L.V. Zankov

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ABSTRACT

The article aims to (1) analyze the conceptions of education, learning and development produced by L.V. Zankov, during a period of 20 years (from 1957 to 1977) of experimental studies that resulted in the construction of the soviet didactic Zankov system; as well as (2) discuss the experimental method and the analysis of development in the three lines that guided the author's research in the field of developmental learning (analytical observation, abstractical thinking and practical actions). The study, the result of theoretical research carried out with unpublished documentary sources in Brazil, located in the original in russian, seeks to: delimit (1) the conception of development defended by LV Zankov; (2) the conceptions of education and learning in their internal dynamics and in relation to development; and (3) the experimental method that is structured based on zankovian fundamentals and gives scope to this didactic system. The analyzes produced denote that, for the author, education, learning and

RESUMO

O artigo tem como objetivos (1) analisar as concepções de educação, aprendizagem e desenvolvimento produzidas por L. V. Zankov, durante um período de 20 anos (de 1957 a 1977) de estudos experimentais que resultaram na edificação do sistema didático soviético Zankov; bem como (2) discutir o método experimental e a análise do desenvolvimento nas três linhas que orientaram as pesquisas do autor no campo da aprendizagem desenvolvimental (observação analítica, pensamento abstrato e ações práticas). O estudo, resultado de pesquisa teórica realizada com fontes documentais inéditas no Brasil, localizadas no original em russo, procura delimitar: (1) a concepção de desenvolvimento defendida por L. V. Zankov; (2) as concepções de educação e aprendizagem em suas relações internas e na relação com o desenvolvimento; e (3) o método experimental que se estrutura com base nos fundamentos zankovianos e dá envergadura para esse sistema didático. As análises produzidas denotam que, para o autor, educação, aprendizagem e desenvolvimento

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development constitute a unit, in view of a type of development that goes beyond its cognitive dimension. It is concluded that the author's scientific contributions imply a methodological proposal whose development emerges as a result of the influence of education-learning, respecting the individual particularities of students, as a cause of psychic development (understood as cognitive, emotive and volitive), even when the affective and volitional dimensions have been, as experimentally approached by L. V. Zankov, subjected to the cognitive dimension.

Keywords: Developmental learning. Optimum general development. Experimental methods. Zankov didactic system. L.V. Zankov.

se constituem unidade, tendo em vista um tipo de desenvolvimento que ultrapassa sua dimensão cognitiva. Conclui-se que as contribuições científicas de L. V. Zankov, implicam em uma proposta metodológica cujo desenvolvimento emerge como resultado da influência da educação-aprendizagem, respeitadas as particularidades individuais dos estudantes, como causa do desenvolvimento psíquico (entendido como cognitivo, emotivo e volitivo), mesmo quando as dimensões afetiva e volitiva tenham ficado, do modo como foi abordado experimentalmente por L. V. Zankov, submetidas à dimensão cognitiva.

Palavras-chave: Aprendizagem desenvolvimental. Desenvolvimento geral ótimo. Método experimental. Sistema didático Zankov. L. V. Zankov.

Introduction

The experimental activity that gave rise to the Zankov teaching system[4] led to the development of a learning method focused on the development of intelligence, feelings and values, with the aim being the general development of students at elementary school in their cognitive, affective and volitional dimensions.

The intense activity carried out within the scope of this work was inaugurated by the psychologist, defectologist, pedagogue and professor soviet

[4]"According to Russian literature, a didactic system is an "[...] interrelated set of educational objectives with the principles of their organization, the contents of education, "[...] organizational forms and methods education; conditioned on achieving the learning objectives adopted by the educational community" (Valeev; Zinnatova, 2013, p. 17). (PUENTES; LONGAREZI, 2020, p. 5). Alternative teaching systems fall into the systems that constitute opposition to the existing official or traditional one and arise based on established criticisms of the current system. In turn, alternative developmental teaching systems are configured as an alternative type, but with a particularity: they are structured to promote the development of students' human capabilities. Previous studies [...] have already allowed us to identify more than twenty systems. [...] The three most important, including due to their national and international repercussion, are the Elkonin-Davidov-Repkin systems; Galpein-Talízina and Zankov." (LONGAREZI, 2023).

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Leonid Vladimirovich Zankov (1901–1977) and resulted, andamong other propositions, in the structuring of didactic principles (ZANKOV, 1963; 1968; 1975 [1984];NECHAEVA;ROSHCHINA, 2006; AQUINO, 2013; PUENTES; AQUINO, 2018; FEROLA, 2019; GUSEVA, 2017; GUSEVA; SOLOMONOVICH, 2017; FEROLA; LONGAREZI, 2021) and methodological guidelines (ZANKOV, 1963; 1975 [1984]; FEROLA; LONGAREZI, 2021), with a view to the integral development of students as defended by him.

Figure 1: Леонид Владимирович Занков (Leonid Vladimirovich Zankov)

Source: tsii.org/12-2474

Leonid Vladimirovich Zankov was born at the beginning of the 20th century, in Warsaw, Poland; he was the precursor of the system that assumed the integral development of the personality as the purpose of learning. A former student of L. S. Vigotski, he deeply studied the problem of the relationship between learning and development and, supportedon the assumptions of your teacher, took as its premise the importance of school taking care not only of the cognitive, but also of the emotional.

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L.V. Zankov's studies were marked by three main themes of interest: (1) psychology of memory; (2) defectology and (3) child learning and development. Research on mnemonic processes, which began during his undergraduate studies (between 1922 and 1925), was carried out based on four lines of investigation: (1) genetic analysis of mnemonic activity; (2) technical analysis of manifestation of mnemonic activity; (3) analysis of the discrepancy between a certain mnemonic task and the actual content of the memorized material; and (4) identification of the specificities of processing information stored in memory and manifestation of such processes in the form of transformation in memory productivity over time. Work on defectology occurred, especially in the 1930s, involving children with hearing and speech impairments, oligophrenia and mentally retarded children.

Research on learning and development, in turn, took place especially from 1957 onwards and accompanied him until his death in 1977. It was during this period that the eponymous didactic system emerged, as a result of the studies carried out by L. V. Zankov and his team to create specific methods aimed at the integral development of students at elementary level, carried out through intense experimental work carried out in laboratory schools in several soviet republics: Abakan, Baku, Frunza, Gorki, Kalinin, Kazan, Kharkiv, Kyiv, Krasnoiarsk, Leningrad, Novosibirsk, Omsk, Penza, Riazan, Riga, Tyumen, Tula, Vologda, Vorkuta, among others.

The architecture of the investigations included numerous researchers and professors who worked in partnership with L.V. Zankov, including: A. V. Poliakova, G. Kumarina, G. S. Rigina, I. Budnitskaia, I. I. Arguinskaia, I. Tovpinets, M. Krasnova, M. Studenkin, M. V. Zvereva, N. A. Tsirulik, N. Chutko, N. Indik, N. V. Nechaeva, N. Y. Dmitrieva, R. Zhuravliova, T. Berkman, U. Kuznetsova and Z. I. Romanovskaia.

The herculean work – which results from the extensive and solid experimental activity carried out in schools in more than 50 territories, regions and autonomous republics of the Russian Soviet Federative Socialist Republic (RSFSR) – consecrated the soviet developmental alternative Zankov didactic system.

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Considered, together with the Elkonin-Davidov-Repkin and Galperin-Talízina systems, one of the most widespread[5], the Zankov system, recognized by the Russian Ministry of Education in 1996 as one of the three state education systems (in addition to the Elkonin-Davidov-Repkin and traditional systems), is the least known in Latin America, including Brazil.

The studies on learning and development carried out by L. V. Zankov, in partnership with the groups that worked with him, take as their motive the criticism of the traditional model of education, supported by what L. S. Vigotski (1926 [2005]) denounced about the sterility of direct teaching of concepts.

> An extremely limited circle of direct knowledge of the surrounding world through excursions and observations contributes to verbalism in teaching. Children's curiosity finds no satisfaction; the fundamental burden falls on memory, to the detriment of thought; There is no or weak internal motivation for learning. The unification of the process of teaching activity does not give the possibility for individuality to manifest and develop. (ZANKOV, 1975 [2017], p. 174).

L. V. Zankov, the first to test L. S. Vygotsky's ideas, aimed to determine the nature and degree of influence of methods as a source of the role of learning in the general development of students. He argues that learning methods play a leading role in the development of school-age children (ZANKOV, 1968). Based on this, he positions himself contrary to the way D. B. Elkonin interprets L. S. Vigotski, focusing on the content:

> [...] in reality, LS Vygotsky never presented the proposition that the source of the role of learning in development is the content of acquired knowledge. What method does DB Elkonin use to interpret LS Vygotsky's ideas so arbitrarily? [...] he puts an equal sign between the content of school knowledge and the assimilation of scientific concepts. Such an operation is completely unjustified (ZANKOV, 1968, p. 44; our translation).

[5]Alternative soviet developmental didactic systems, as well as the criteria for their identification, can be better understood in Puentes and Longarezi (2020); Longarezi (2019; 2020a; 2020b; 2021; 2022; 2023); Puentes, Longarezi and Marco (2022) and Longarezi, Puentes and Marco (2023).

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The Zankov system, considering that it is the organization of learning and not the content[6] which influences development, was not concerned with restructuring the contents that are assimilated at the fundamental level (PUENTES; AQUINO, 2018). The focus was on differentiating the ways and conditions in which the content was worked on. Therefore, the zankovian approach was guided by the elaboration of didactic principles, learning methods and educational tasks contained in the manuals. Experimental learning was conducted based on methodological principles and guidelines with a view to achieving optimal general development of students.

To understand the relationship that the author establishes between education, learning and development, which constitutes the central core from which the Zankov didactic system is built, as well as the experimental method that guides studies on this topic, this article seeks to define: (1) the conception of development defended by L. V. Zankov and, more particularly, that of optimal general development; (2) the concepts of education and learning in their internal relationships and in relation to development; and (3) the experimental method that is structured based on zankovian foundations and gives scope to this didactic system.

1. Development, general development and optimal general development in the approach of L.V. Zankov

The relationship between education, learning and development can be understood in different ways. Under the epistemological basis of historical-dialectical materialism, in a marxist-leninist approach, development is a process that occurs under specific social influences and, in this sense, determined by the type of education and learning to which one is subjected. Historical-cultural

[6]Content here does not correspond to the subjects of school subjects, but to theoretical thinking that consists of the formation of the scientific concept and generalized modes of action (PUENTES; LONGAREZI, 2013).

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psychology, which follows this trend, builds its theses based on the understanding that education and learning are causes of human development.

L.V. Zankov, pioneer of experimental work that structures the theory of developmental learning, started in 1957, addresses development in its interrelationship with education and learning (ZANKOV, 1963; 1968). For him, development

> [...] is the movement from the simple to the complex, from the lower to the higher, the movement along the ascending line, from the old qualitative state to the new qualitative state, the process of renewal, the birth of a new, the die of the old (ZANKOV, 1968, p. 27, our translation).

This understanding has links with the thought of L. S. Vygotsky, for whom development is characterized by the emergence of psychic neoformations that are characterized by being more complex than elementary psychic functions. These are profound and significant internal changes in elementary psychic functions and the constitution of more elaborate (superior) functions. From this perspective, L.V. Zankov considers that, "[...] in the learning process, mental functions are reconstructed, they acquire a new character" (ZANKOV, 1963, p. 12, our translation).

However, L.V. Zankov has a dialectical perspective in relation to the marxist-leninist approach to human formation and development when he recognizes that, in addition to the external determination by learning in development, there are internal conditions that act in this process (DAVIDOV, 1995). In a dialectical approach to development, the external and the internal act as opposing forces in struggle, whose unity emerges in the form of neoformation. Between learning (established by socio-culturally defined social processes) and the existing level of development (conditioned by internal aspects) results in the "self-movement" of development characterized by syntheses and new psychic formations. The author positions himself by recognizing that "marxist dialectics does not underestimate, much less deny, external causes. But, external causes act through the internal" (ZANKOV, 1963, p. 21, our translation). Furthermore, he argues that, "as a result of the development of contradictions, a dialectical step takes place from the old to the new. A development that does not rely on its

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previous forms of existence is not possible" (ZANKOV,1975 [1984], P. 216, our translation).

It is evident that the author considers development based on the central law of dialectics: the unity and struggle of opposites. External influences and the student's internal conditions, presented as contradictory elements inherent to the process of human development, act as driving forces of development. This position places L.V. Zankov's thought in a perspective that expands and advances the marxist-leninist approach.

For the author, leadership of education and learning processes in the constitution of development does not imply a deterministic or unilateral vision. This means that the dependence of development on learning does not result in a one-way relationship. "In addition to external determination, internal conditions are characteristic of the development process. Its basis is unity and the struggle of contradictions." (ZANKOV,1975 [1984], P. 212, our translation).

From this perspective, he argues that development results from the unity of internal and external processes, in the context of the struggle between the contradictions inherent to these two dimensions. "The correct approach to studying the development of the child's psyche in the learning process is intrinsically linked to the understanding of development as a kind of unity of opposing tendencies" (ZANKOV, 1963, p. 21, our translation). However, he does not clarify exactly what this internal conditionality would be and how it would act in this dialectical process. This was not a concern of the author who focuses his studies on methods that promote development. Even when he assumes that there are internal conditions that act dialectically in development processes, his experimental work focuses on aspects focused on external conditions that drive development.

The psychological and pedagogical essence of the Zankov system consists in combining the leading role of learning in development. However, with the work of the teacher it presupposes an extremely careful attitude towards the inner world of each child in their individuality (ZVEREVA, 2002). In this sense, learning will act differently on each student, according to the synthesis resulting from the learning-internal characteristics of development unit.

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L.V. Zankov highlights the existence of an objective relationship between the structure of learning and the development of students. He emphasizes that this is not the same as the traditional model[7]. His formative experiments highlighted the developmental potential of learning organized for this purpose, demonstrating the relationship with what he called the optimal development of students (ZANKOV,1975 [1984]). The results of the experiments were being produced in comparison with control classes that followed a traditional approach.

Within the scope of this approach, optimal development refers to the intensive development of students, the result of learning capable of promoting qualitative changes in the child that imply new formations, the effects of which are different in nature from those found in a traditional perspective. This development does not mean seeking the same result for all students. The purpose of the experimental system as named by L.V. Zankov[8], is not to take students considered "weak" to the level of "strong" ones, but to reveal the individual abilities of each one and, regardless of being considered "strong" or "weak", act in their individuality promoting their own development (NECHAEVA;ROSHCHINA, 2006).

From an even more specific perspective, the development aimed at by the system is not just optimal development, but general[9] great development; which means the integral development of the student, along the lines of intellect, emotions and will. That

> [...] corresponds to the diverse development of mental activity. Integral development in this sense differs from mental development in that it includes not only cognitive processes, but also will and feelings. (ZANKOV, 1968, p. 25, our translation).

[7]Understood as an approach to reflex-associative learning theory,as differentiated by Davidov's learning theories,(1996 [2019]), the traditional perspective consists of the model based on the methodillustrative-explanatory.

[8]"Unlike VV Davidov, Zankov (1975) calls the proposal developed by him and his collaborators an "experimental didactic system", instead of a "developmental didactic system". However, when defining it, he recognizes its developmental nature when writing that "the structure of the experimental didactic system is based on the idea of enabling greater learning effectiveness for the general development of students." (ZANKOV, 1984, p. 28, translation and highlights added)." (PUENTES; LONGAREZI, 2020, p. 221).

[9]We treat the terms "global development", "integral development" and "general development" as synonyms.

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The Elkonin-Davidov-Repkin system was criticized by zankovians (NECHAEVA; FEROLA, 2020) for its emphasis on the development, particularly, of theoretical thinking, limiting itself to its cognitive dimension, even when Davidov (1988) recognized that the psychic processes include cognitive processes, emotions, etc. The Zankov system explicitly defends development in its entirety, which corresponds to what the author called general development; included qualities such as intelligence, will, inner feelings and moral values.

For the author, "The general development of the personality means a harmonious combination of spiritual wealth, moral purity and physical perfection" (ZANKOV, 1968, p. 7, our translation). However, even though he stated that "general development" is integrated by both physical and mental development, his investigations did not include the study of the relationship between learning and physical development in particular. Therefore, when dealing with general development, it is done with data relating to the development of the psyche or psychic activity of students (ZANKOV, 1968;1975 [1984]), understood not just restricted to thought, but including emotions and will.

> General development differs from mental development in that it encompasses not only cognitive processes, but also will and feelings. As is known, in psychological science to this day, will and feelings (or emotions) stand out as special aspects of the psyche in contrast to sensations, perceptions, memory, thought and other cognitive processes (ZANKOV, 1968, p. 25, our translation).

From the Zankovian perspective, general development is constituted "[...] as a holistic process: that is, each mental neoformation arises as a result of the interaction of all aspects of the psyche: the mind, will and feelings of the child" (NECHAEVA;ROSHCHINA, 2006,P. 133, our translation). This is because, as L. V. Zankov demonstrates, the solution of practical situations also involves emotional-volitional aspects of psychic activity (ZANKOV,1975 [1984]). Consequently, psychic development involves not only the mental development and theoretical thinking, but also the emotional and volitional aspects of the psyche. L.V. Zankov proposed these three lines of development, analogously designated byhead of research at the Zankov Federal Scientific-Methodological Center,

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Natália Vasilevna Nechaeva, as development of the "mind", "heart" and "hands" (NECHAEVA; FEROLA, 2020).

Regarding the development of the "mind", the intellect and everything that surrounds it, that is, the higher psychic functions (language, perception, representation, imagination, logical memory, attention, concentration, logical reasoning, theoretical thinking, etc.), L. V. Zankov recognizes the main role of theoretical knowledge, indicating it as one of the didactic principles within this system. For the author, achieving general development implies a type of experimental learning that makes the student capable of having a broad view of the world, based on theoretical knowledge, to the detriment of a purely empirical view.

> Theoretical knowledge in the experimental system is by no means exhausted by terms and definitions. Much more important is the assimilation of dependencies, laws (for example, the relative law of addition and multiplication in the course of mathematics, the regularity of seasonal changes in the life of plants and animals in natural science, etc.) (ZANKOV, 1968, p. 38, our translation).

As for the "heart" dimension, N.V. Nechaeva (NECHAEVA; FEROLA, 2020) refers to the development of will and emotions, which corresponds to the student's spiritual needs. Students' emotions during learning are associated with their characteristic of motivating force and their ability to increase or reduce student activity. "Emotion is characterized as man's attitude towards the world, towards what he experiences and accomplishes in the form of direct feelings. Emotions express the state of the subject and his attitude towards the object" (ZANKOV,1975 [1984], P. 63, our translation). Therefore, for student learning and reasoning, feelings are fundamental and, therefore, need to be considered in relation to their didactic organization (GUSEVA, 2017).

The cognitive dimension is thought of in unity with the affective, "In fact, the will and the intellect can be separated only at the level of scientific abstraction. In concrete activity, they are inseparable" (ZANKOV,1975 [1984], P. 73, our translation). However, emotions, as treated by L.V. Zankov, are restricted to the sense of providing motivation or the absence of will-interest for studying. Cognitive

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interest is associated with the affective state, that is: "Learning must be joyful, because when a person is upset, they have no interest in thinking" (NECHAEVA; FEROLA, 2020). Emotions arise from the student's contact with the subject and material and according to their particularities.

> Without human emotions there was no, just as there is not and cannot be a human search for truth" – said Lenin. For example, for an active, creative work of thought, it is of utmost importance that man, when faced with something incomprehensible, which engenders a question, 'be amazed', warm up emotionally with this question, so that the incomprehensible arouse the emotion of amazement. Doubt, which arises in the absence of firm proof, forces one to carry out the work of thought to the end, despite all the difficulties that lie along the way (ZANKOV,1975 [1984], P. 63, our translation).

In the zankovian proposal, it is understood that both the study raises emotions, and emotions have the power to move the subject towards the study; both influence each other. However, learning must promote positive emotions to awaken interest in studying; which means that emotional development is subject to cognitive development.

Finally, with regard to the development of "hands", its use can be seen in a double sense. On the one hand, N.V. Nechaeva (NECHAEVA; FEROLA, 2020) refers to practical activities and manual work that constitute school content in the russian education system, more particularly in elementary school. On the other hand, it extends to the development of problem-solving skills and human attitudes (development of moral values). In this way, the Zankov system values, in addition to the ability to solve intellectual problems (development of the mind), the training of the child to solve practical problems in everyday life.

Emma Viktorovna Vitushkina (VITUSHKINA; FEROLA, 2020) considers that one of the main contributions of the system is student learning to solve practical problems. For her, "this program teaches people to be independent, teaches students to find information and useful things in life" (VITUSHKINA; FEROLA, 2020).

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In this sense, the Zankovian approach understands optimal general development as the development of the child's personality in all its aspects[10]. The division of development into intellect, will and emotions is a traditional division that was overcome by L.V. Zankov's approach.

2. Education-learning-development in the approach of L.V. Zankov

The leading role of development education was already known and assumed by Soviet psychology since the 1920s, with initial work by L. V. Vygotsky. Advancing the understanding of the effects of education and learning on student development and, more precisely, how this influence is exerted has become fundamental within the scope of natural experimental research.[11]. With regard to the experimental work, carried out by LV Zankov's teams, it was taken as

> [...] starting point [...] the provision that learning, which focuses only on mastering knowledge and skills, cannot bring a high result in the development of children of school age: it is necessary to especially think about and build the learning process, keeping in mind the task of development (ZANKOV, 1968, p. 21-22, our translation).

L.V. Zankov recognizes that education and learning processes go beyond the limits of the school. In addition, different sociocultural contexts influence development, family education, children's organizations, books, radio, cinema,

[10]It is worth noting that the concept of personality in focus is linked to the socialist context in force in the former Soviet Union, a period in which alternative developmental Soviet didactic systems were created, including the Zankov system. However, far from being a hegemonic concept between historical-cultural and developmental approaches - see, for example, in Asbahr and Longarezi (2022) -, personality in the sense attributed by LV Zankov and his research teams deserves to be the object of future studies.

[11]"[...] the experiments were configured, with specific natures, into two types, the so-called laboratory experiments and natural experiments. In the first of them, the participant has the information that something is happening in him in relation to the activity he is developing and that, therefore, he is subjected to a type of experimentation. In this model, the experiment takes place, most of the time, outside the classroom, in an artificial environment created for investigative purposes. In such conditions, in the laboratory, the experiment can be carried out both individually and collectively. Differently, in the natural experiment, the subjects are in a natural learning condition, in the classroom space. This is also why, often, there is no information that one is undergoing an activity of this nature, leaving students in conditions that are usual for them in educational activity." (LONGAREZI, 2019, p. 197).

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theater, etc. Studying the relationship between learning and education in depth to understand the specific links between them and development makes up the research problem assumed by Zankov (1963) and his groups and constitutes the central core of the experimental activity they carry out.

In his view, the organization of learning that promotes development needs to consider the organic link between learning and education. Learning is part of the human education process, which is more general and is not restricted to the school environment, but is also present there; "[...] learning is a very real part of the education process." (ZANKOV, 1963, p. 10, our translation). L.V. Zankov agrees that both are responsible for psychic development, however, he emphasizes that this occurs based on certain conditions and individual and age characteristics of children.

In the case of school education, the influence on the child's development comes, especially, from the teacher or the person responsible for the student's educational process. However, the degree of demand is linked to the child's development process: "[...] the growth of demands is possible thanks to the fact that, in the course of development, new opportunities are created to meet them [...]" (ZANKOV, 1963, p. 9, our translation). That is, as development occurs, the challenges for the child at school also increase, so that new crises are allowed to reach higher levels development complexes.

Although learning and education have their particularities, L.V. Zankov defends the dialectical unity that exists between them, which he assumes within his experimental activities (ZANKOV, 1968). Both are treated as contradictory forces that, in tension and struggle, bring about the student's integral development, as a synthesis.

In the author's approach, this unit holds the important assumption that the school is not only responsible for developing the intellect, but also the moral; in the sense attributed by Ya. K. Ushinski who defends elementary education aimed at the mental and moral development of children (KOSTIUK, 2005). L.V. Zankov, given the historical and political context of the former Soviet Union, brought this to the field of experimental education, arguing that "life urgently demanded a

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decisive improvement in the cause of moral education at school" (ZANKOV, 1968, p. 7); while "[...] a sacred duty of the teacher" (ЗАНКОВ, 1990, p. 332).

Bearing in mind the moral and social dimension of students' development, the experimental effort undertaken by L.V. Zankov and the various collaborators who worked with him, is effective based on the premise of genuine education-learning-development unity.

2.1 Particularities of the conception of the learning-development relationship by L.V. Zankov in dialogue with L.S. Vigotski: collaborative activity and independent activity.

Although L.V. Zankov agrees with L.S Vygotsky that the role of learning is to generate development through the transformation of the possible level into the real[12], highlights that "[...] the zone of possible development does not represent the only way (as L.S. Vigotski suggested) for learning to influence children's development" (ZANKOV, 1963, p. 12; our translation). Consider that the role of the teacher or collaborator in the learning process is not necessarily for the student to imitate. The teacher can, for example, organize the material the child is dealing with in their own way. In cases like this:

> [...] the teacher does not help the child, granting the completion of tasks entirely to their independent efforts. Imitation is completely ruled out. Meanwhile, in the process of an independent solution to the questions posed, the child advances in a particular field of mental activity (ZANKOV, 1963, p. 13, our translation).

The author argues that the "zone of possible development" as a defined way of influencing learning on psychic development, is characterized by the fact that the teacher shows a way of doing the work and the student imitates it. According to him, this model restricts the ways in which learning and development communicate (ZANKOV, 1963). Peculiarity of L.V. Zankov's thought that, in a certain way, constitutes the object of criticism by those who see there a conflict

[12]For which cooperation is a decisive condition in this process (ZANKOV, 1963).

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with one of the central theses of Vygotskian theory that only learning that acts at the student's possible level, and in collaboration with the Another one, try it, it is capable of generating development. The criticism is based on the argument that the child's resolution of the task, carried out independently, rules out imitation/collaboration and, therefore, the student could only perform it at the level of their real development.

In this line of reasoning, it is considered that the thesis of good learning that acts in the "tomorrow" of development is interpreted by L.V. Zankov in a particular way. Its didactic principle, "learning at a high degree of difficulty", is an indicator that the zone of possible development and working at the student's level of difficulty constitute an important guide for pedagogical activity. In essence, it contemplates the Vygotskian idea that "[...] children regularly exposed to the zone of possible development, in which they encounter suitably challenging puzzles and problems, would advance in terms of cognitive development and feeling of self-efficacy" (GUSEVA, 2017, p. 230).

From a Vygotskian perspective, such problems, as they are at the potential level, can be resolved through collaboration and imitation, which makes it possible to transform the student's potential level into a real one, generating development. However, in the zankovian approach, it is not only in the ZPD that there is the possibility of development; "[...] to ensure optimal learning, children must be allowed to work on their own to solve problems" (GUSEVA, 2017, p. 230). Thus, collaboration and imitation for L.V. Zankov are not the only means of creating conditions for development.

3. Experimental method from the perspective of the Zankov system

The method of studying the development of psychic activity that guided L.V. Zankov's experimental work was the method of units that LS Vygotsky elaborates. In his view, investigating development in parts (sensation, perception, ideas, memory, etc.) is a mistake and does not allow us to truly understand the child's optimal general development. Through units, it is not restricted to one or another

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aspect of the organism or personality, but to all of them (VIGOTSKI, 2001 [2018]). Therefore, the method of pedology is the method of units, which is based on the analysis by decomposition of the whole into moments that constitute and form it (VIGOTSKI, 2001[2018]).

In the method of units, decomposition does not occur by elements (parts that make up the psyche) because they do not contain properties of the whole; decomposition occurs into units. These constitute the parts of the whole that contain the fundamental characteristics of the whole. According to L.S. Vygotsky, if

> [...] I want to explain why water puts out fire, why some bodies sink and others float in water, I cannot answer this by saying that water is composed of hydrogen and oxygen, its chemical formula being H2O, because, when decomposing it into hydrogen and oxygen, the properties present in it disappear in these elements. They belong to water only as it is water. [...] So, for the analysis that uses decomposition into elements, [...] it decomposes a whole into parts that do not contain properties of the whole and, therefore, excludes the possibility of explaining the complex properties present in the whole that is constituted by the properties of the isolated parts. (VIGOTSKI, 2001[2018], p. 39).

L.V. Zankov understood that, by decomposing into units, it is possible to know the whole, as the units contain their essential aspects (ZANKOV,1975 [1984]; AQUINO, 2013). “In general terms, the unit is the living cell, that is, it is born, feeds, metabolizes and dies, changes, transforms and can also become ill, etc. In other words, in the small cell, we deal not with the element, but with the unit.” (VIGOTSKI, 2001[2018], p. 40)

The investigation method that guided the research carried out by L.V. Zankov considered two fundamental aspects: (1) the determination of the objective regularities of psychic processes implies the organization of these regularities to the same extent as it is conditioned by them; and (2) the method requires an experimental foundation for changes to materialize.

The experiment, as a general scientific method, allows studying the relationships of certain dimensions of learning and development and establishing the aspects that have implications in determining the processes that drive development. In a general sense, the experiment makes it possible to highlight the

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laws of reality under study, the changes in the conditions of determination of phenomena and their intrinsic relationships (ZANKOV,1975 [1984]).

> The substantial characteristic of the experimental pedagogical investigation of the problem of learning and development is the fact that the revelation of the objective logic of the learning process is not only inextricably linked to its restructuring, but is conditioned by it. There is no need to understand this link as a mere application of research results in school practice: its method necessarily requires an experimental basis for changing existing practice. In the pedagogical investigation of the problem of learning and development, the revelation of the objective logic of the teaching process is, at the same time, the search for ways through which the desired results in the development of students can be achieved (ZANKOV,1975 [1984], p.16).

L.V. Zankov, in a systemic approach, understands, based on the pedology method, that changing any of its elements implies changing all the others because the relationships between them change.

The experimental work carried out leads to the determination of the aspects that cause changes and development, allowing the author to confirm the Vygotskian thesis that learning is a driver of student development.

> The object of the study is to highlight the objective pedagogical logic in the correspondence between learning and development. When the correspondence between learning and development is studied as a pedagogical problem, the search for and substantiation of learning paths that lead to the achievement of optimal general development acquires primary importance." (ZANKOV, 1975 [1984], p. 15, our translation).

The research took as its central question the investigation of the objective laws that determine the relationship between learning in the initial years of school education and the optimal general development of students. The experimental method that was being improved after the approval of the 1958 resolution on the work of the Academy of Pedagogical Sciences of the Transcaucasian Soviet Federative Socialist Republic (RSFST) and on the strengthening of its ties with schools and pedagogical research centers, already had its elaborate basesby Zankov Laboratorysince the early 1950s(ZVEREVA, s/n).

The first stage of experimental work was carried out in 1957 with a class from school no. 172 in Moscow, in collaboration with teacher N. V. Kuznetsova, where the structure of the new didactic system was created; this was considered a

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pilot study. For a period of four years, the life of the class team as a whole and that of each student in their particularity were studied. For the effectiveness of the experimental work, a pedagogical laboratory was created at school nº 172.

Figure 2: L.V. Zankov and his laboratory team with students from the first experimental class at School 172 in Moscow. First in the second row from the left is A.V. Polyakova. In the second row, to the left of L.V. Zankov, M.V. Zvereva, and to the right Z.I. Romanovskaya.

Source: https://idfedorov.ru/about/history/page=3/category=99/article=867/

In the subsequent stages, the experimental activity, which was initially restricted to one room, was later extended to Kalinin and Tula (in the second stage); expanding to more than 1000 classes of students, in 52 territories, regions and/or autonomous republics of the RSFSR and in 8 union republics, coveringAbakan, Baku, Frunza, Gorki, Kalinin, Kazan, Kharkiv, Kyiv, Krasnoiarsk, Leningrad, Novosibirsk, Omsk, Penza, Riazan, Riga, Tyumen, Tula, Vologda, Vorkuta, among others(in a third stage) (ZANKOV, 1999).

The laboratory developed an initial version of experimental programs in russian language, mathematics, manual skills and singing. Based on the ongoing work, methods for learning natural sciences and geography were established and teaching materials were created for the various school subjects. Teachers were

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oriented towards managing experimental classes and were taken to Moscow, Kalinin or Tula once a quarter. More frequently, researchers attended experimental classes and discussed them in detail with the teaching team. In this way, the experimental program was built with the active participation of teachers, from planning to class management. The laboratory team made numerous trips to the various republics where experimental work was carried out.

3.1 Analysis of development in three lines: analytical observation, abstract thinking and practical actions

Based on the general principles of the unit method, the experimental work that created the Zankov developmental alternative didactic system took into account *(1) analytical observation*; *(2) abstract thinking* and *(3) practical actions,* as ways to study the development of students' psychic activity.

Analytical observation involves sensory experience; *abstract thinking*, the cognition of the essence of phenomena; and *practical activities*, the solution of practical problems linked to the material effect on the environment (ZANKOV, 1963). The way L.V. Zankov conceived it, the three lines (*observation, abstract thinking* and *practical actions*) are related to the most important aspects of general development.

For this analysis, the researchers carried out individual experiments with students and compared the results achieved by students in experimental classes and those in control classes, in order to analyze qualitatively and in detail the general development driven by this specific type of learning.

Observation takes place through perception, which, as sensorial knowledge of reality, allows students to carry out analyzes and syntheses of the objects observed. This process is conducted so that the student can observe an object and talk carefully about it. The characteristics of the object that is placed under observation delimit the nature of the analysis and synthesis that takes place. Students' observation is not directed with questions that induce them to observe

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one particularity or another of the object: "[...] in order to reveal with the greatest possible perfection and accuracy how observation changes, under certain learning conditions, [it is] necessary to give students freedom to carry out the task [...]" (ZANKOV, 1963, p. 64).

From a more in-depth analysis of observation data, a broader interaction of this type of activity was found than just mental operations. The emotional-volitional sphere manifested itself in the observation process: a long-term sustained inner impulse to activity emerged, which indicates the activity of volitional processes. It was also noted the emergence of brilliant emotional reactions, such as surprise, interest and a happy attitude towards carrying out the task (ZVEREVA, 2002). These results show that, from the Zankovian perspective, there is a dependence of emotional-volitional development on cognitive development. In other words, it is understood that the first (emotive-volitional development) is subject to the second (cognitive development).

As the three lines of development of mental activity are not independent, the processes of observation, thought and action have an important relationship with each other. For example, during observation there are thought processes that project actions, and even though they are present in different degrees of importance and, therefore, acting in different ways in the development process, they reveal a connection between these lines.

> The composition of observation includes a type of thinking. These mental processes are directly based on sensory cognition of reality and represent only the initial analysis and synthesis of data from sensory experience (names of colors, shapes and other properties, the establishment of differences and similarities directly) (ZANKOV, 1963, p. 64).

In the line of development of *abstract thought* lies "[...] the closest and deepest essence of knowledge of the phenomena of objective reality" (ZANKOV, 1963, p. 65). Thought activity during the process of sensory perception allows for fundamental changes in the quality of thought, such as abstraction and generalization.

The method used was modified from L.S. Sakharov. The task consists of students, when dealing with geometric bodies different from each other due to their

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shape, size and color, discover the principle of grouping figures into different groups and differentiate them based on their peculiarities (AQUINO, 2013). Thus, through the experiment, it was possible to outline (1) how the student experiences the abstraction processes; (2) from which characteristics he is guided in the selection and organization of figures; and (3) whether he is able to consider objects simultaneously, on the basis of two or three different characteristics. "The task that the student had to perform consisted of guessing the principle of grouping the figures into different groups and differentiating these groups in a practical way" (ZANKOV,1975 [1984], P. 105, our translation).

The third line of development, *practical actions*, includes manual operations, concrete activities, that is, the creation of a material object. However, treated in its interconnection with the other lines, in the composition of practical actions, perception and thought are fundamental components (ZANKOV, 1963).

> Concrete practical reality is characterized not only by skills and motor habits, it also manifests itself in a concrete way in the sensorial sphere, spatial concepts and mental activity. Overcoming obstacles related to carrying out practical activity also highlights certain emotional-volitional aspects of psychic activity (ZANKOV,1975 [1984], P. 118, our translation).

In individual experiments, for example, people were asked to make a paper box, guided by observation of a ready-made one. If they were unable to create it with paper, they received a model, with lines indicating the folding locations. If they still had difficulties, they received molds to build the box. The experiment was carried out by including groups of different levels of development. To ensure that the student understood the process of making the box, after observing the model, the student was asked to report the procedure they plan to perform to assemble the box, as success in carrying out the task includes identifying the operations necessary for its construction. The ability to plan reveals a greater level of awareness on the part of the student about the proposed activity.

Through practical activities, the relationship between observation, thought and action is revealed, since, to carry out the proposed task, it is necessary to analyze the object to be made (its parts, the necessary operations, the way it will end) and synthesis (interrelating the parts for their production).

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Both in the development of *analytical observation*, *abstract thinking* and *practical actions*, the results found among students in experimental classes are qualitatively different from the changes observed in control classes. The experiments made it possible to demonstrate that, compared to the traditional one, the zankov system was able to boost the psychic development of students.

Some considerations.

L.V. Zankov has a conception of development that is particular to him and leads him to defend a special type of learning that promotes the optimal general development of students, understood in its cognitive, affective and volitional dimensions. Understanding this learning as part of integral education, in its intellectual and moral dimensions, it experimentally demonstrates the education-learning-development unit, focusing on a type of psychic development that is not restricted to a cognitive approach. The author advocates that education and learning are aimed at the integral development of the personality.

The conceptual understanding that it develops is based on the principle that the human constitution does not occur only under the determination of external conditions. There are internal conditions that act as a contradictory force to externally presented situations and that result in the emergence of new elements as a synthesis of the struggle between opposing aspects. This results in a methodological proposal in which school education operates in an individualized manner and is not intended to be the same for everyone, it assumes that internal constraints direct different development processes among students.

Furthermore, it argues that learning does not occur only as an imitative-creative process, as defended by the Vygotskian theory of the zone of possible development. It takes the independent activity of students as its beginning, middle and end. It highlights that this type of activity is equally relevant because from it it is possible to develop the student's mental processes in a particular field.

Based on the unit method, it proposes a type of experimental activity based on the analysis of development along three lines: (1) analytical observation, (2)

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abstract thinking and (3) practical actions. This experimental approach that leads to the student's integral development contributed to building their conceptions of education, learning and development that support the soviet Zankov developmental didactic system.

From the experimental work carried out, it understands and defends a development as a result of the influence that education-learning exerts, on certain individual particularities of students, as a cause of psychic development (cognitive, emotional and volitional), even when the latter (affective and volitional), in the way the system is built, have been subjected to the first (the cognitive).

Educación-aprendizaje-desarrollo y el método de investigación en la concepción de L. V. Zankov

RESUMEN
El artículo tiene como objetivo (1) analizar las concepciones de educación, aprendizaje y desarrollo producidas por L. V. Zankov, durante un período de 20 años (de 1957 a 1977) de estudios experimentales que dieron como resultado la construcción del sistema didáctico soviético Zankov; así como (2) discutir el método experimental y el análisis del desarrollo en las tres líneas que orientaron la investigación del autor en el campo del aprendizaje desarrolladora (observación analítica, pensamiento abstracto y acciones prácticas). El estudio, resultado de una investigación teórica realizada con fuentes documentales inéditas en Brasil ubicadas en el original en ruso, busca delimitar (1) la concepción de desarrollo defendida por L. V. Zankov; (2) las concepciones de educación y aprendizaje en sus dinámicas internas y en relación con el desarrollo; y (3) el método experimental que se estructura en base a los fundamentos de Zankov y el alcance a este sistema didáctico. Los análisis producidos denotan que, para el autor, la educación, el aprendizaje y el desarrollo constituyen una unidad, en vista de un tipo de desarrollo que va más allá de su dimensión cognitiva. Se concluye que los aportes científicos del autor implican una propuesta metodológica cuyo desarrollo surge como resultado de la influencia de la enseñanza-aprendizaje, respetando las particularidades individuales de los estudiantes, como causa del desarrollo psíquico (entendido como cognitivo, emocional y volitivo), incluso cuando las dimensiones afectiva y volitiva han sido, como lo abordó experimentalmente L. V. Zankov, sujetas a la dimensión cognitiva.

Palabras clave: Aprendizaje desarrolladora. Gran desarrollo general. Método experimental. Sistema didáctico Zankov. L. V. Zankov.

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